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Algorithms of Tintinnabuli Form in the Music of Arvo Pärt

ABSTRACT

Background

In 1976, Pärt found his own original style and technique — *tintinnabuli* (from Latin 'bells'). From this time on, the musical thinking of the composer firmly includes *'tintinnabul genes'*, according to Pärt's apt expression. They combine the works of the composer, written in the *tintinnabuli* technique or not directly related to it, and are always perceptible thanks to the purity and rigor of the sound, in what the composer defines as 'the spirit of music'. The very name *tintinnabuli* contains not only a metaphor for sound. This is a special philosophy of the creation of Pärt, comparable to the 'spiritual fast' — 'escape into voluntary poverty' (Pärt, A. 1990), full of humbleness and prayerful concentration.

We recognise Pärt's style of tintinnabuli unmistakably through a complex of such simple means as diatonic scale, a combination of scalar and triadic lines. However, it is only an *upper* layer of the *musical material*. The style 'mechanisms' of *tintinnabuli* music are revealed in the *new hearing* of these traditional means and are concentrated in its 'core' — numbers, numerical formulas that determine the strict discipline of the structure of the musical material.

In Pärt's music, the number is the source of all the sound structures, and this is an objective basis for finding a new approach to studying his music.

Pärt's music is *well-structured* and *aphoristic*, but these properties come from the source that differs completely from that, for example, of Webern's music. *Tintinnabuli* is a system of composition aimed at the *global reduction* of all possible parameters of musical means to certain primary basis, the prerequisites of the musical language.

At the same time, simple and transparent, to the auditory's sense, music of *tintinnabuli* from the point of view of strictness of organization of its system is comparable to the serial technique (serialism). Structuralism here acquires the importance of the inherent quality of the texture configuration and is based on the numerical logic of the structure and connection of textural voices. Although the rules of *tintinnabuli* technique concern only the pitch structure of the work, often the rhythm in the composition is subject to strict rules.

However, the *tintinnabuli* technique is not connected with the serialization of the parameters of sound, its essence consists in the *numerical programming* of the musical form on the basis of *formulaic thinking*, and this is a qualitatively different kind of creativity in comparison with serialism.

The formulaicity of *tintinnabuli* has its own 'prototype' in post-serial technique.

Unlike the formulaic technique of Stockhausen, which, in fact, remains serial, the forms in the music of *tintinnabuli* of Pärt are created on a fundamentally different numerical basis — in diatonic or polymodal systems (the latter combines the diatonic and one-and-half-tone scales or, very rarely, the chromatic and diatonic scales) and, thus, embody a new understanding of simplicity and postulate a *new style paradigm* of audible simplicity and structural complexity.

Tintinnabuli music connects seemingly incompatible things: the all-encompassing rationality of the modern avant-garde with the breath of the melos of early polyphony, refracting these qualities in a *new method of formulaic composition*.

Aims and repertoire studied

Let's consider the basic principles of the pitch-sound technique of Pärt — the ways of combining a *melodic voice* and *tintinnabuli*-voice. These names of voices (or in the abbreviation — M-voice and T-voice) are used by the composer.

For the compilation of numerical formulas, algorithms of the *tintinnabuli* form, we suggest that we use, with some additions, the system of symbols for the elements of the Pärt's technique, developed in the works of the Austrian theorist L. Brauneiss (Brauneiss, L.).

We can start with a simple scheme, where the M-voice is the descending tetrachord in the a-eolian mode and the T-voice is the succession of tones in the a-moll triad. We will write the M-voice with white notes, and the black will be for the T-voice (see Scheme 1).

Scheme 1
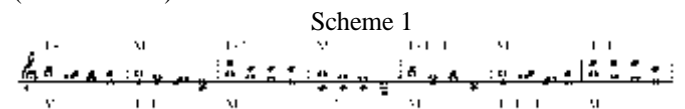
The logic of connection of voices is transparent: the choice of *upper* or *lower* tones of a triad in relation to M-voice, or tones *'alternating'* manner is possible. We have to choose either the *nearest* tone of the triad, or the *next* tone, located through one tone of the triad, or the *farthest tintinnabuli*-tone within one octave (through two tones of a triad). Octave compounds of tones, as a rule, are avoided. A transposition of any of the listed methods is possible.

For the T-voice formulas, we will use the + or – signs (means the upper or lower T-voice position relative to the M-voice) and the Arabic numerals (1 — the nearest tone of the triad relating to the M-tone, 2 — the next tone selected in one tone, and 3 — in two tones). Such are the formulas: T+1 or T–1 for the upper or lower nearest T-tones, in a relatively close disposition; T+2 or T–2 for tones in a relatively wide disposition; T+3 or T–3 for the selection of the farthest T-tone in the octave range, T+1/–1 or T–1/+1 for alternating T-tones.

The melodic voice in the *tintinnabuli*-texture is usually subject to strict regularities. There are four modes, or *formulas* of M-voices depending on the location of the modal central pitches (Scheme 2). Let us designate the central pitches of scalar modes in Roman numerals. This movement from the main tone down or up and, accordingly, descent or ascent to the basic tone.

The function of the modal central pitch can be any tone of the scale of the work.

Scheme 2
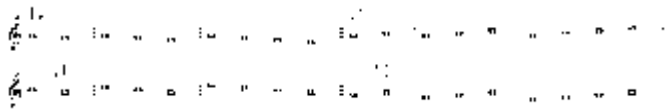
The form of tintinnabuli is essentially a *form with output voices* from one basic M-voice: T-voices — sonorous-colored 'unison' or interval thickening of M-voices; M-voices of the score 'multiply' according to the principles of counter-movement, duplication or continuous imitation.

The *tintinnabuli*-form of Pärt is a special kind of *counterpoint*, in which its essential ancient properties are revived in the new style paradigm: the identity of the counterpoint-harmony-form, the convergence of the horizontal and vertical, the potentially monodic texture (non-linear 'point' interval composition and the canon as a linear similarity), the lack of the thematic design and differentiation of compositional syntax in their classical understanding, the modal non-functionality of harmony.

The structural design of the *tintinnabuli* composition is primarily related to the 'computation' of the tone succession of the basic shaping M-voice based on one of two 'programs': an autonomous *numerical series* connected with additions or rotations, or *text*, all parameters of which are used by the author as numerical series. At the same time, this information is included in the counterpoint algorithm specified in the numerical formula, or the structural core, according to the rules of which the counterpoint is displayed. Both principles are applied in the composer's vocal as well as instrumental music.

Let's explain the scheme of *tintinnabuli*-algorithms with an example. The score 'Missa syllabica' for four voices or mixed choir and organ (1977) embodies the most stable signs of *strict style* of *tintinnabuli* (the main criterion is the strict and consistent application of the technique studied). Among them: the 'modus' of purity and detachment (diatonic scale), the transparency and strictness of the counterpoint, the simplicity of the formulas of M-voices, in which the central pitches coincide with the *tintinnabuli* tones.

The early style of *tintinnabuli* in 'Missa syllabica' is evidenced by a black and white 'stem-less' notation and, above all, a conditionally-measured system, when a word corresponds to a measure. The composer uses this system in his works primarily with Latin texts. The musical form in such works is associated with quantitative rhythm, partly due to the composer's attention to the phonetic structure of the Latin language, in which the longitude of syllables is meaningfully distinctive, as well as the influence on the Pärt style of European medieval music of the 11th–13th centuries, which is characterized by modus rhythmics. So, in 'Missa syllabica', the shortest duration is related to the largest ones like 1:2, 1:3 and 1:4. The slowing down of the rhythm marks the endings of the lines (rarely — the beginnings). In the perception of the rhythmic form of the cycle, the syntax of the text is involved. All the boundaries of the construction — phrases, lines (each punctuation mark) — are indicated by a double bar line in the score and expressed by pauses of different depths (Luftpause, pauses from two to nine quarters). The distinctive property of 'Missa syllabica' is a clear distribution of the M- and T-voices

over the timbre: M-tones are vocal, *tintinnabuli* refers to the party of organ.

Each part of this cycle develops according to a certain algorithm. Let's consider the algorithm 'Sanctus', the fourth part of 'Missa syllabica'. At first glance, it looks like a variant development, a sort of random verticals. In fact, there is no freedom. In every word there is a constant 'number' — $M_1 \uparrow I (T_1 + 1/-1)$, $M_2 \downarrow I (T_2 - 1/+1)$ — the formula of melodic and *tintinnabuli*-voices.

Both M-voices are duplicated in the upper octave (which follows from the rule for connecting M- and T-tones), while the melodic modes, concluding by the location of the central pitch, are connected with the divergent movement to the main tone of *f*, which invariably appears on the last syllable. T-voices consist of the nearest 'alternating' tones of a triad, differently directed by indices (first the upper and lower tones are added to the corresponding M-voices, then vice versa).

All the further implementations of this formula, or 'core', are programmed with text: the formula is stretched or shortened depending on the length of words. *Scheme 3* shows the algorithm for converting the pitch structures of a given 'core' depending on the constructions of words consisting of one, two, three, and four syllables.

Scheme 3
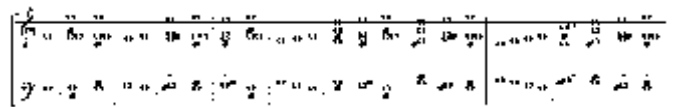
The formula in music *tintinnabuli* can be defined as a *numerical program*. It defines the algorithm of development and at the same time contains all the variety of pitch structures of the work. Harmony of tintinnabuli is very special: it has a *contrapuntal nature*, where each vertical in the composition is 'programmed' by a numerical formula.

Methods

In our work we were guided by the further development of the *method of formulaic analysis* proposed by L. Brauneiss, which most accurately reflects the regularities of *tintinnabuli* music.

Implications

In Pärt's compositional technique, the methods for working with melodic material, the logic of which is calculated with the help of the arithmetical progression, and with verbal text, all the parameters of which are most frequently used by the composer as a mathematical foundation for the construction of melodic voices (in other words, the text 'dictates' numerical progressions), can be considered equally important. Unlike the arithmetical progression, the text allows of the 'reading out' of more diverse and multilevelled numerical progressions that are projected into counterpoint, harmony (the vertical pitch structure), and the logic of form as a whole. To a large extent, this is exactly the source of the novelty of *tintinnabuli*.

Keywords

Pärt Arvo, Tintinnabuli style, technique, form, algorithms.

REFERENCES

Brauneiss, L. 'Grundsätzliches zum Tintinnabulistil Arvo Pärts', *Musiktheorie*. Laaber, 2001. 16/1: 41–57; Idem. 'Sissejuhatus

tintinnabuli-stiilisse', *Arvo Pärt peeglis. Vestlused, esseed ja artiklid,* koost. E. Restagno. Tallinn: Eesti Entsüklopeediakirjastus, 2005: 157−221; Idem. 'Pärts einfache kleine Regeln. Die Kompositionstechnik des Tintinnabuli-Stils in systematischer Darstellung', *Arvo Pärt. Die Musik des Tintinnabuli-Stils,* Hg. v. Hermann Conen. Köln: Verlag Dohr, 2006: 103−161.

Pärt, A. 1990. 'Tintinnabuli — Flucht in die freiwillige Armut', *Sowjetische Musik im Licht der Perestroika: Interpretationen, Quellentexte, Komponistenmonographien*, Hg. v. H. Danuser, H. Gerlach, J. Köchel. Laaber: Laaber Verlag, 269.